EHC

CEREMONY REPORT
FOR THE PLAQUING OF

MEADOWBANK RAILWAY BRIDGE

over the Parramatta River, Sydney
8 July 2001

Engineering Heritage Committee, Sydney Division, I E Aust

ENGINEERING HERITAGE COMMITTEE

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OPEN INVITATION

to a

PLAQUING CEREMONY

for the

MEADOWBANK RAILWAY BRIDGE

on

SUNDAY 8 JULY, 2001 at 2 pm.

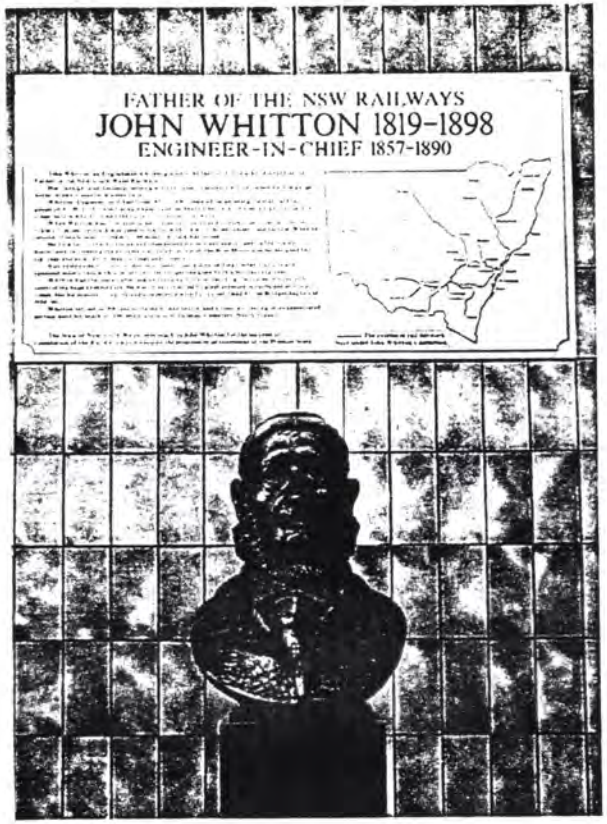
The Institution of Engineers will honour the1886 iron lattice bridge over the Parramatta River between Rhodes and Meadowbank as an HISTORIC ENGINEERING MARKER. This bridge and the 1889 Hawkesbury River railway bridge were the largest structures on the railway link from Sydney to Newcastle. Sir Henry Parkes, in his speech at the opening of the latter bridge, used the physical uniting of South Australia Victoria and southern New South Wales to northern New South Wales and Queensland as symbolic of the need to unite the colonies into a federated Australia.

LOCATION – Meadowbank Memorial Park, northern side of Parramatta River, Immediately west of the railway bridges.

PUBLIC TRANSPORT – Rydalmere River Cat service from Circular Quay. City Rail service to Meadowbank railway station.

PARKING – It is of limited capacity at water level near the Meadowbank wharf. It's better in Meadowbank Crescent on the north side of the park.

BYO PICNIC – Make it a picnic day, there are BBQ facility at the site.



COMMEMORATIVE BUST

AND

INFORMATION PLATE

ON THE

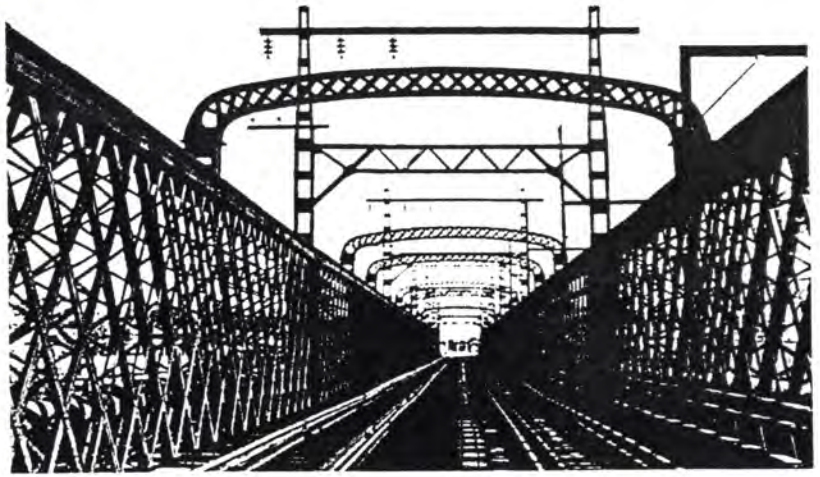
CONCOURSE, SYDNEY TERMINAL

The Institution of Engineers, Australia

State Rail Authority of New South Wales

PLAQUING THE

1886 MEADOWBANK RAILWAY BRIDGE



AT THE

MEADOWBANK MEMORIAL PARK

8 July 2001, 2 PM

CEREMONY PROGRAMME

roduction – Ian Arthur, Chairman, Engineering Heritage Committee, Sydney Division, Institution of Engineers, Australia.

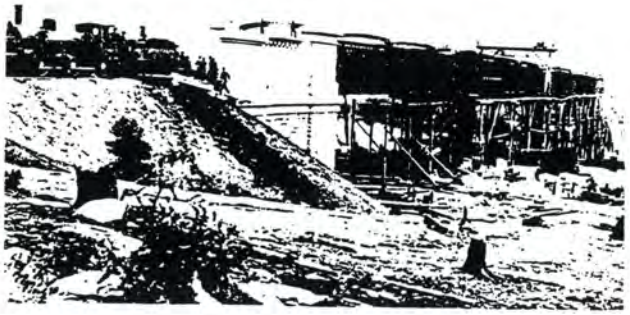
uncillor Ivan Petch, Mayor, Ryde City Council.

uncillor Michael Wroblewski, Mayor, Canada Bay Council

Matthew Jones, Project Manager – Metro North, Rail Infrastructure Corporation.

Andrew Leventhal, President, Sydney Division, Institution of Engineers, Australia.

eiling the plaque.



The bridge near completion.
Opened for traffic 17 September 1886

STATEMENT OF SIGNIFICANCE

The Meadowbank Railway Lattice Bridge, over the Parramatta River between Rhodes and Meadowbank, Sydney was completed in 1886. It is among the oldest of the surviving colonial railway bridges in New South Wales.

It was the eleventh in a set of twelve iron lattice bridges built between 1871 and 1887.

This set of bridges is the most significant group of railway bridges of colonial NSW.

The Meadowbank Bridge is the largest of the group.

The proponent of the use of the iron lattice bridges was Engineer-in-Chief John Whitton, acknowledged as the "father of NSW railways".

The bridge was a major item of infrastructure for the important 1889 railway link from Sydney to Newcastle.

It was part of the railway link that joined the northern New South Wales and Queensland railways to the railways of southern New South Wales, Victoria and South Australia which was used as a symbol of the emerging Federation of Australia.

The bridge has a commanding visual appearance on its tall pairs of cast iron cylinders.

Its heritage significance is enhanced by the juxtaposition of welded box girders which show the change in bridge technology in 100 years.

Although the bridge was decommissioned in 1980, its potential to serve under less demanding loads was recognised. A deck has been installed for use by pedestrians and cyclists, leaving the original tracks in position.

Immediately upstream of the 1886 bridge is this1980 welded box girder bridge, the John Whitton Bridge.

The ceremony took place in the riverside park upstream of the bridges, overlooking the Parramatta River.

The ceremony was introduced by Ian Arthur, Chairman, Engineering Heritage Committee, Sydney Division, Institution of Engineers, Australia.

Councillor Ivan Petch, Mayor, Ryde City Council.

Councillor Neil Kenzier represented Canada Bay Council, the sister Council on the south side of the river, linked by the pedestrian/cycleway on the old bridge.

Matthew Jones, Rail Infrastructure Corporation, represented the State Rail Authority of NSW. His speech notes follow.

Meadowbank Bridge Speech

by Matthew Jones, Rail Infrastructure Corporation

8 July 2001

- The 1886 Meadowbank bridge is amongst the oldest surviving colonial railway bridges in New South Wales
- It was part of the railway link that joined the NSW and Queensland railways to the railways of southern NSW, Victoria and Sth Australia. This was used as a symbol of the emerging Federation of Australia

- Railway services began in NSW in 1855. The first line ran from Redfern to Granville, a journey of approximately 20 km.
- Over the next 15 years from 1855 to 1870 500 kilometres of railway were built:
  - From Sydney south to Goulburn
  - From Sydney west to Bathurst (including the Zig-Zag railway at Lithgow)
  - And from Newcastle to Aberdeen in the Hunter Valley
- From 1870 there was a rapid acceleration in construction over the next 20 years.
- Between 1870 and 1890 the total length of operating railway lines increased seven-fold to 3500km
- During this 20 year period some major coastal and inland rivers were crossed including the Hunter, Hawkesbury, Lachlan, and Murray Rivers as well as the Parramatta River here between Rhodes and Meadowbank. Many of these rivers were known for their large and destructive floods, and hence required large-span bridges to cross them.

- During the latter half of the nineteenth century, the iron lattice girder was the dominant bridge type for road and rail in Britain and European countries, and also in their colonial empires. By contrast in America a variety of truss type bridges were the most popular designs.
- John Whitton chose to use the iron double lattice girder style for 12 bridges built between 1871 and 1887. The style was chosen because it was believed to be a technically superior design and offered the potential for a long service life (borne out by the fact the fact that the bridge still stands today).
- The main advantage of the lattice girder was the saving in weight it offered, as well as the increased stiffness of the spans. The open web lattice enabled the sizes of the web members to be adjusted to suit changes in shear force across the span. This provided significant savings in web material when compared to a plate web girder. This was important because at the time of construction the cost of materials was much more important than the cost of labour. Typically a labourer's wage was 10 shillings per day.

- The first of the 12 lattice girder bridges was built at Aberdeen crossing the Hunter River and was completed in 1871. The twelfth was built at Cowra across the Lachlan River and was completed in 1887.
- The Meadowbank bridge was the eleventh of the set of twelve.
- It was one of only two of the twelve lattice bridges designed for double track (the other at Albury over the Murray). It was also one of only two of the lattice bridges with 6 spans (the other at Como in Sydney's south). This made the bridge at

Meadowbank the largest of the group. Interestingly, all of these bridges had spans of the same length (159 feet or 48.5 metres).

- The basic designs for the bridge were prepared in Sydney. John Fowler, a renowned British consulting engineer based in London, was responsible for the design check and preparation of the drawings.
- The 12 lattice girder bridges were all of similar design. It appears that this may have been because of the rapid expansion and construction going on at the time. This would have saved design time and helped maintain the delivery and construction schedules.
- The superstructure for the Meadowbank bridge was fabricated in England, and erected by a local contracting company.
- The bridge superstructure was designed to be supported by pairs of cast iron cylinders.
- Construction commenced in 1885 and was completed in 1886, making this bridge an important part of the 1889 railway link from Sydney to Newcastle
- The bridge was load tested by Harry Deane (John Whitton's deputy) on 10 September 1886. Five steam locomotives ranging from 63 to 72 tons were used. They ran back and forth across the bridge in varying combinations. The deflection was recorded at the centre of each span. The maximum deflection was 1 inch (or 25mm) which over a span of 159 feet (48.5m) represented a very stiff structure.
- The bridge was put into service on 17 September 1886.
- The total cost of the bridge was £69000.
- It continued in service for many years, but eventually load and speed restrictions had to be applied.
- Plans for replacement of the bridge were made soon after World War II.
- The initial design for a steel replacement bridge using a Pratt Truss design was completed just as the 1952 recession took place.
- Work was then suspended for a further 20 years. During this time the old bridge began imposing some serious constraints on railway operations.
- Finally in 1972 a decision was made to replace the bridge. New technology was now available, and a lightweight steel welded box girder configuration was selected.
- The new box girder bridge was completed in 1980, and has been named the John Whitton bridge.
- After the lattice bridge was decommissioned it appeared nobody wanted it. There was talk of handing over the bridge to the then Department of Main Roads for a road bypass to Ryde, or to the Water Board or even AGL because they had pipelines attached to the bridge.
- There were also plans drawn up to demolish the bridge.
- Then in the lead up to the Olympics discussion commenced about saving the old bridge. Eventually agreement was reached between Councils, SRA and RTA to jointly fund the conversion of the bridge to a cycleway, which now links the foreshore cycleways north and south of the river.

With a new purpose, the 1886 Meadowbank bridge stands in stark contrast to the modern structure that replaced it. The Meadowbank bridge remains as a reminder of the significant part that the railways played in the latter part of the 19th century in linking the various colonies that were soon to come together with the Federation of Australia in January 1901.

Andrew Leventhal, President, Sydney Division, Institution of Engineers, Australia made the dedication of the 1886 bridge as an Historic Engineering Marker.
His speech notes follow.

The plaque unveiled by the official party.

Distinguished guests
Members of the Institution of Engineers Australia
Members of Engineering Heritage Australia
Ladies and Gentlemen

Thank you for the opportunity to contribute to today's proceedings.
Thank you for the kind words of introduction.

I represent the **Institution of Engineers, Australia** at this ceremony, in my capacity as President of Sydney Division. I do this with pride, as the **Australian Historic Engineering Plaquing Programme** provides a means of recognition of the contribution of the Engineering Profession to the well-being of the community.

I have been asked to explain to you some of the background to the **Australian Engineering Heritage Plaquing Programme**. Kindly bear with me for a few minutes before the plaque is unveiled.

The Institution of Engineers Australia (IEAust) is the peak body representing the professional engineering team. IEAust has over 60,000 members Australia-wide. Of these, some 16,500 are affiliated with Sydney Division. In reality, "Sydney" is a bit of a misnomer, since the coverage of Sydney Division is all of NSW with the exception of the NE (which is covered by the Newcastle Division) and the area local to Canberra.

The Institution of Engineers, Australia has a broad spread of interests:
- It promotes and advances the science and practice of engineering in all its forms.
- It encourages the development of Australia's technological capacity and its contribution to our economic growth.
- It provides advice on policy input on engineering and technology to Government.
- And IEAust provides services to our members - through professional standing, continued professional development and graduate development programmes, amongst many others.

One of the important parts of the **public** face of IEAust is the activities of our Engineering Heritage Committees. Our presence here today is evidence to that value.

So, what is heritage?? Heritage is the evidence of our past that we leave to future generations.
- It doesn't have to have high monetary value, and it doesn't have to be beautiful – though I'm sure that helps!!!
- Most people think of heritage as being buildings, but it is a lot more.
- Heritage does visually and tangibly tell us that "we stand on the shoulders" of our forebears. In that way, it tells where we came from, and why our infrastructure is the way it is.
- And without it, I suggest, our society would be spiritually poorer.

More than other professionals, it is the engineer who has provided our national infrastructure. In this context, I refer to the comment by HRH Princess Anne at the Inaugural RedR address by Jose Ramos-Horta. This event occurred in September last year, just before the Olympics. Princess Anne, in her capacity as President of RedR in the UK, noted that the most important public health advance, one that has saved more lives that all the medico's, is CLEAN WATER....courtesy of the Engineering Profession.

The work of the IEAust Heritage Committee therefore is about:
- making people aware of our rich engineering heritage

- making them aware of the contribution of engineers, and
- encouraging the conservation of important engineering works.

and.....

....this brings me to the **Historic Engineering Plaquing Program**. This programme is one of the important public awareness campaigns of our Heritage Committee:

- Its purpose is to bring public recognition to significant engineering works, and the engineers who create them.
- For works of outstanding national importance, there is the **National Engineering Landmark** award, of which 19 so far have been awarded throughout Australia. Amongst these include: the Sydney Harbour Bridge, the Parkes Radio Telescope and the Snowy Mountains Scheme. The latest was unveiled in April, being for **Broken Hill Mines and Infrastructure**. This was jointly sponsored with the Line of Lode Association, and was a Centenary of Federation event.
- For works of regional significance, there is the **Historic Engineering Marker**. So far, 64 of these have been awarded nation-wide.....the works and engineer we honour today make that 65.
- **The Meadowbank Railway Bridge** joins such diverse works as: Parramatta Dam (one of the earliest masonry arch dams in the world), Locomotive 3801, the Bendigo Gas Works, the Furphy Water Cart (and that is the Furphy who is the origin of the saying), Smith's Stump Jump Plough, the Railway Bridges near Wagga, the BMC-Leyland Motor Vehicle Plant at Zetland (which was a world leader in its day), the Sydney Tramway Museum and Wollongong Harbour.

I trust this provides some background to today's ceremony.

Why the 1886 Meadowbank Railway Bridge??

The Meadowbank Railway Lattice Bridge is amongst the oldest of the surviving colonial railway bridges. You have heard from our MC, **Ian Arthur**, of some of the history of the bridge itself and its part in the railway link from Queensland, through NSW, Victoria and South Australia as a symbol of the emerging Federation --this being particularly apt in this year, the Centenary of Federation. You will also note the Statement of Significance in today's programme brochure.

You have heard from **Councillor Ivan Petch, Mayor of Ryde City Council** and from **Councillor Neil Kenzler, for the Mayor of Canada Bay Council**, about the worth today of the bridge to area. You have also heard from **Matthew Jones, of the Rail Infrastructure Corporation**, of details of the 1886 Bridge which was one of John Whitton's projects - iron lattice bridges were his trademark for major bridges - and how the box girder bridge beside the original bridge was named after him. You can see that most things have been covered. As a result, I have been asked to tell you a little about the engineer who was the "father of NSW Railways".

John Whitton developed the railways of NSW during the second half of the 19th century, from a set of primitive city-based railway lines in Sydney and Newcastle, to a network of just less than 3500 kilometres of track throughout the colony. This was a comprehensive, well planned, rail network that connected the main parts of NSW and which became the foundation of the present rail system.

John Whitton was born in Wakefield, Yorkshire, England in 1819. During his early career in England, he was influenced by the high standards of construction used in Britain, which were based on two "golden rules":

1. That adoption of a uniform track gauge was operationally sound, and
2. That initial high standards, although expensive, were best in the long term.

These were to involve Whitton in technical and political disputes during the following 34 years which he spent with the NSW Government Railways.

In March 1856, aged 36, Whitton was appointed to the position of Engineer-in-Chief to lay out and construct railways in NSW. His salary - £1,500. When he took up his position in Sydney in January 1957, there were 37km of railway near Sydney and 27km near Newcastle – a total of 64km of track. The dual questions of gauge and standard of construction had to be resolved, and immediately, Whitton was in direct conflict with Governor Denison and successive colonial governments in his attempts to satisfy the "golden rules".

In terms of the first "golden rule", Whitton was able to prevent breaks of gauge within NSW, but could not persuade the Government to adopt the Victorian 5ft-3in (1600mm) gauge, so NSW retained a 4ft-8_in (1435mm) gauge – but at least, the gauge **was** uniform throughout the NSW system. [Wasn't it in the **19**60's that a standard gauge finally applied between Sydney and Melbourne??]

For the second "golden rule", Whitton successfully opposed plans to construct cheap light-rail railways hauled by horses. He was able to build the first of the railway extensions to a high standard and operated by steam locomotives.

The first major works under Whitton's direction were the extensions from Liverpool to Goulburn and from Penrith to Bathurst. Two large wrought iron bridges were built across the Nepean River, at Menangle in 1863 and at Penrith in 1867. Both are still in use, the one at Menangle for railway use and the one at Penrith now as a road bridge. In order to climb and descend the Blue Mountains, Whitton chose to use two zig-zags, the Little Zig-Zag on the eastern side at Lapstone and the famous Great or Lithgow Zig-Zag on the western side. With these works, and when the line from Maitland to Murrurundi was completed in 1876, 20 years into his term, NSW had 715km of main line railway.

The next 14 years to 1890, saw a rapid expansion of railway construction to a total mainline length of 3,500km. John Whitton and his staff had prepared most of the designs and plans, had supervised all the contracts, and had load tested the bridges before approving them for rail traffic. Principal works of this period included: twelve lattice girder bridges; the first Hawkesbury River Bridge; many long timber viaducts across wide river flood plains; and many tunnels varying in length from 150m to 1,600m. The twelve lattice girder bridges were the most significant set of railway bridges built in colonial NSW and represent the pinnacle of use of British bridge technology. The Meadowbank Bridge was the widest and longest (being a twin track and six span bridge) of this set of twelve.

During John Whitton's 34 year term as Engineer-in-Chief from 1857 to 1890, he served 26 successive Ministers of Works. Whitton was under constant pressure to change plans to suit political ends. Nevertheless, Sir Henry Parkes regarded John Whitton as (and here I quote) a "man of rigid and unswerving integrity".

Whitton retired in May 1890, and he died 8 years later in February 1898 in Mittagong. His career and service earned him the distinctive title of "Father of the NSW Railways" – as you will see on the back of your programme. Whitton was buried in St Thomas' Cemetery, Cammeray, where incidentally he shares a resting place with George Barney (1792-1862), Colonial Engineer from 1835 to 1844, and who was responsible for the initial works for the Wollongong harbour that was plaqued in April.

I trust these snippets provide with some background to the engineering "father of NSW railways" and of the Meadowbank Railway Bridge. It comes with good credentials.

Now, we are here today for the unveiling of an **Historic Engineering Marker** – the plaque. That reminds me of an e-mail I received last week……..

> [The Plaque]
> One Sunday morning, the pastor noticed little Johnny was standing staring up at the large plaque that hung in the foyer of the church.
> The young man of seven had been staring at the plaque for some time, so the pastor walked up and stood beside him and gazing up at the plaque he said quietly, "Good morning, son."
> "Good morning, Pastor" replied the young man not taking his eyes off the plaque. "Sir, what is this?" Johnny asked.
> "Well son, these are all the people who have died in the service", replied the pastor.
>
> Soberly, they stood together staring up at the large plaque. Little Johnny's voice barely broke the silence when he asked quietly, "Which one sir, ……..the 8:30 or the 10:30?"

That having been said…..

I'd like to now refer to the text of the plaque of **this** Historic Engineering Marker, which reads……

[…… read text of plaque ……]

It is now my pleasant task to ask our distinguished guests to join me in unveiling this **Historic Engineering Marker** within the **Australian Historic Engineering Plaquing Programme**.

MEADOWBANK HERITAGE PLAQUE

The old Meadowbank Railway Bridge

Contrary to the weather forecasts, an Australian standard specification for a fine winter afternoon was in operation for the July 8 unveiling of an IEAust historic engineering marker plaque for the Meadowbank Railway Bridge over the Parramatta River.

The 1886 wrought iron lattice girder bridge was the largest of twelve commissioned by John Whitton, engineer-in-chief of NSW Railways. It has six 48.5m spans and is one of two bridges in this series which carry two tracks, the other being over the Murray at Albury. John Fowler designed the bridge which remained in service for ninety four years before rail traffic moved to the modern, welded box-girder bridge on its western side, and which is named the John Whitton Bridge. For the structurally minded, the old bridge has continuous spans in groups of three. A characteristic of this group of bridges is the provision of overhead bracing arches rising from the top chords of the main spans.

The old bridge now supports a much smaller live load in that it carries pedestrian and cycle paths between the cities of Ryde and Canada Bay.

Left to right: Mayor Ivan Petch (City of Ryde), Councillor Neil Kenzler (City of Canada Bay), Matthew Jones (Rail Infrastructure Corp), and Andrew Leventhal (Sydney Division President).

POWERTEL

PowerTel Engineering Careers Expo 2001

PowerTel, Young Engineers Sydney and the Institution of Engineers, Sydney Division are pleased to bring you the annual Careers Expo, to be held this year on Wednesday 8th August.

Students:

Don't miss this opportunity to meet potential employers. Are you interested in post-graduate studies? Come along to the Expo and meet a range of companies including:

- PowerTel
- Rail Infrastructure Corporation
- Hyder Consulting
- URS Australia
- BTR Automotive
- TransGrid
- Brown & Root Australia
- Polartechnics
- Energy Australia
- CSIRO Energy Technology
- PPK Environment & Infrastructure
- University of Sydney
- UTS
- UNSW
- Golder Associates
- Ove Arup
- Connell Wagner
- Coffey Geosciences
- Taylor Thomson Whitting
- Calibrate Recruitment

Admission is free.

A number of workshops are also being held for high school students to learn more about the range of disciplines in engineering.

The evening will run from 5pm to 8pm and is being held at the Carlton Crest Hotel, Thomas Street, Sydney.

Futher information may be obtained from Barbara Deutschle at Sydney Division on phone 02 8923 7112 or email bdeutschle@ieaust.org.au.

ENGINEERING EXCELLENCE AWARDS 2001

Tickets are now available for this gala event to be held on Friday 2 November in the Tumbalong Ballroom at Sydney Convention Centre, Darling Harbour.

Secure your seats for just $120 plus GST. Tickets may be obtained from Leanne or Paula at Kara Management Services on phone 02 9967 2133 or email info@kara.com.au.

DIARY DATE
Fellows Luncheon

The next Fellows Luncheon will be held on Friday 14 September at Strangers Dining Room, Parliament House.

Our guest speaker will be Mr Mario Cortopassi, President, International Organisation for Standardisation (ISO).

"THE WEEKLY TIMES" (N.W. SUBURBS)
11/7/01

Ryde City Mayor Clr Ivan Petch unveiled a plaque commemorating the 1886 Meadowbank Railway Bridge designed by "Father of NSW Railways" John Whitton over Parramatta River on Sunday. Pictured with Mayor Petch are, l to r, Clr Neil Kenzler representing City of Canada Bay, Matthew Jones of Rail Corporation and Institution of Engineers president Andrew Leventhal. TWT on-the-spot PHOTO.